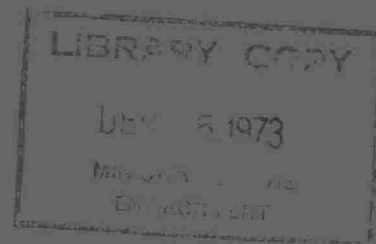


1972

OPERATING SUMMARY

SAULT STE. MARIE



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MINISTRY OF THE ENVIRONMENT

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Ontario

Ministry of the
Environment

135 St. Clair Avenue West
Toronto 195, Ontario

We are pleased to present you with the 1972 operating summary for the water pollution control plant serving your community.

This summary contains data on the performance of the plant as well as relevant financial information. Of particular interest is the review of the year's activities in which significant items of these data are discussed in some detail by the operations engineer and his staff who, by their day-to-day involvement with the operation, are thoroughly familiar with the plant.

We appreciate your continuing interest in protecting the environment through the efficient operation of this wastewater treatment facility.

D.S. Caverly,
Assistant Deputy Minister.

D.A. McTavish, P. Eng.,
Director,
Project Operations Branch.

MINISTRY OF THE ENVIRONMENT

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Honourable James A.C. Auld

DEPUTY MINISTER
E. Biggs

ASSISTANT DEPUTY MINISTER
D.S. Caverly

EXECUTIVE DIRECTOR
K.H. Sharpe

PROJECT OPERATIONS BRANCH

DIRECTOR
D.A. McTavish

ASSISTANT DIRECTOR
C.W. Perry

ACTING REGIONAL SUPERVISOR
B.W. Hansler

OPERATIONS ENGINEER
E. Czarnecki

135 St. Clair Avenue West
Toronto 195

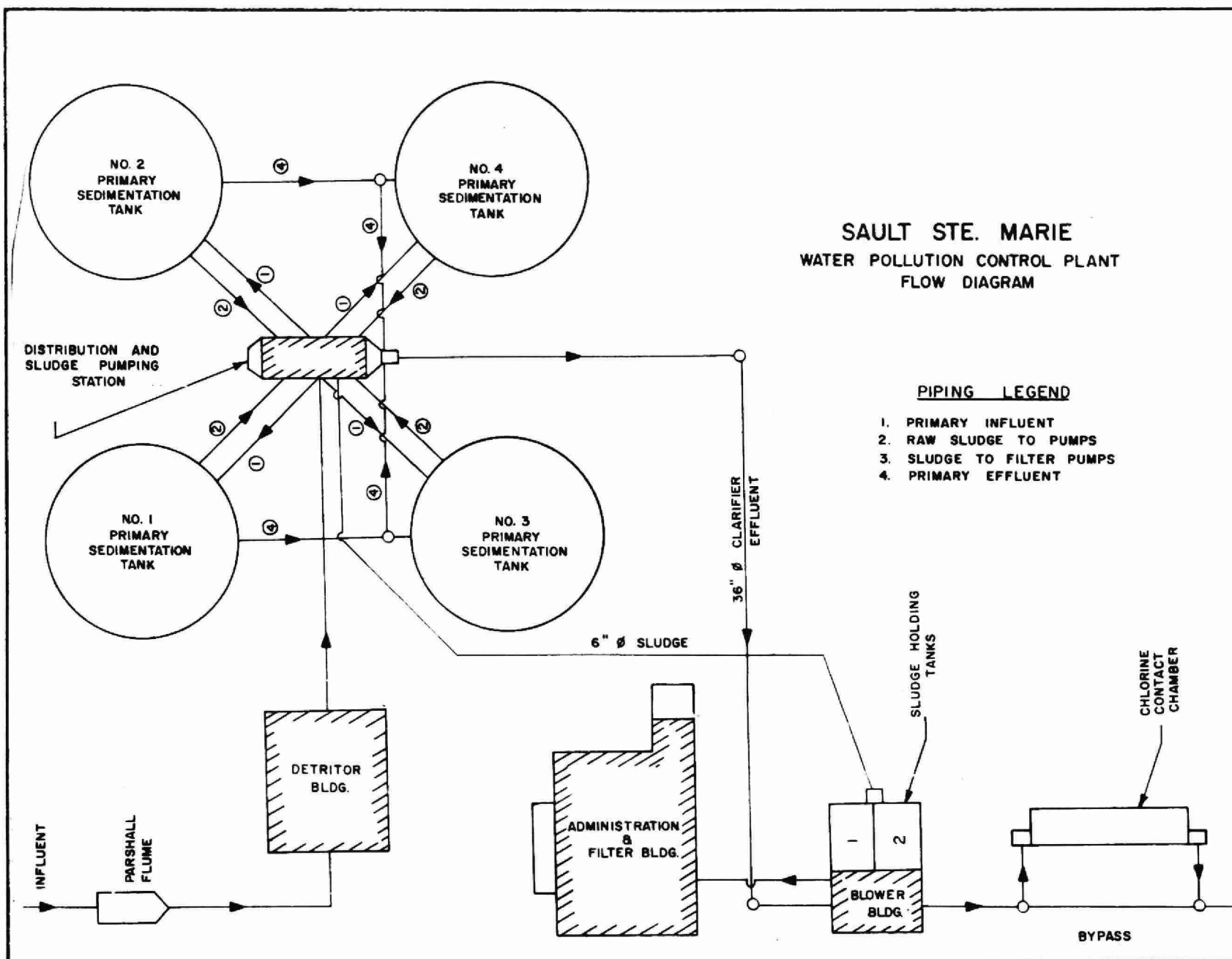
SAULT STE. MARIE
WATER POLLUTION CONTROL PLANT

operated for
THE CITY OF SAULT STE. MARIE
by the
MINISTRY OF THE ENVIRONMENT

1972 ANNUAL OPERATING SUMMARY

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DESIGN DATA

PROJECT NO. 2-0020-58

TREATMENT Primary

DESIGN FLOW 8.0 mgd

DESIGN POPULATION 72,500

BOD - Raw Sewage 250 mg/l
- Removal 35%

SS - Raw Sewage 200 mg/l
- Removal 60%

PRIMARY TREATMENT

Comminution

Type: Barminutor
Size: Two Model C (36")

Grit Removal

Type: Dorr detritor
Size: Two 15' x 18' x 1'3"
(6,240 gal)
Retention: 1.13 min
Flow Velocity: 0.209 fps

Primary Sedimentation

Type: Dorr
Size: Four 70' dia x 8' swd
(900,000 gal)
Retention: 2.3 hr
Loading: Surface, 520 gal/ft²/day
Weir, 13,000 gal/ft/day

CHLORINATION

Type: W & T
Size: One 500 lb/day

Chlorine Contact Chamber

Size: One 60' x 20' x 12'
Reten (90,000 gal)
Retention: 16.2 min

OUTFALL

- to St. Mary's River

SLUDGE HANDLING

Holding Tank - Aerated

Size: Two 24' x 15' x 11 $\frac{1}{2}$ '
(8,280 cu ft or 51,600 gal)
Air Supply: One Sutorbilt

Vacuum Filter

Type: Komline-Sanderson
Size: Two 200 sq ft

PUMPING STATIONS

Pim Street Pumping Station

Type: Worthington
Size: One 10,000 gpm @ 50' tdh
(diesel)
Two 6,300 gpm @ 40' tdh
(electric)

Clark Creek Pumping Station

Type: Worthington
Size: One 12320 gpm (electric)
One 13000 gpm (diesel)
Two 7000 gpm (electric)
One diesel generator

Wiita Pumping Station (Temporary)

Type: Smart-Turner
Size: 2400 gpm @ 30' tdh (electrical)

'72 Review

GENERAL

The plant was overloaded during the year. Engineering design was conducted for plant enlargement to be constructed in 1973. An emergency forcemain by-pass for the Clark Street Pumping Station is now under study.

PLANT FLOWS AND CHLORINATION

A total of 3747.7 million gallons were received in 1972 at an average daily flow of 10.2 million gallons. This represents 128 percent of the design flow of 8.0 million gallons per day. The average daily flow exceeded the design flow 83 percent of the time. A total of 190,400 pounds of chlorine was applied at an average dosage of 5.1 mg/l throughout the year.

PLANT EFFICIENCY

The raw sewage BOD averaged 115 mg/l and was reduced by 33 percent. The influent suspended solids averaged 138 mg/l and was reduced by 61 percent.

VACUUM FILTRATION

The total solids concentration in the filtered sludge was 24 percent. The amount of sludge applied to the filters was 8,080,000 gallons.

Conditioning chemicals were not used throughout the year and an excellent filter yield of 9.3 pounds per square foot per hour was realized.

CONCLUSIONS

The water pollution control plant and pumping stations were operated efficiently during the past year. It is expected that the forth-coming enlargement will improve plant performance during peak flows.

PROJECT COSTS

2-0020-58	
NET CAPITAL COST	\$3, 244, 149. 35
DEDUCT - Portion financed by CMHC (Final	(2, 145, 572. 61)
MUNICIPAL ADVANCES	<u>(2, 900. 00)</u>
Long Term Debt to MOE	<u>\$1, 095, 676. 74</u>
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1972	\$ <u>320, 225. 74</u>
Net Operating	\$ 189, 642. 74
Debt Retirement	10, 335. 00
Reserve	13, 314. 93
Interest Charged	<u>61, 444. 41</u>
TOTAL	\$ <u>274, 737. 08</u>

RESERVE ACCOUNT

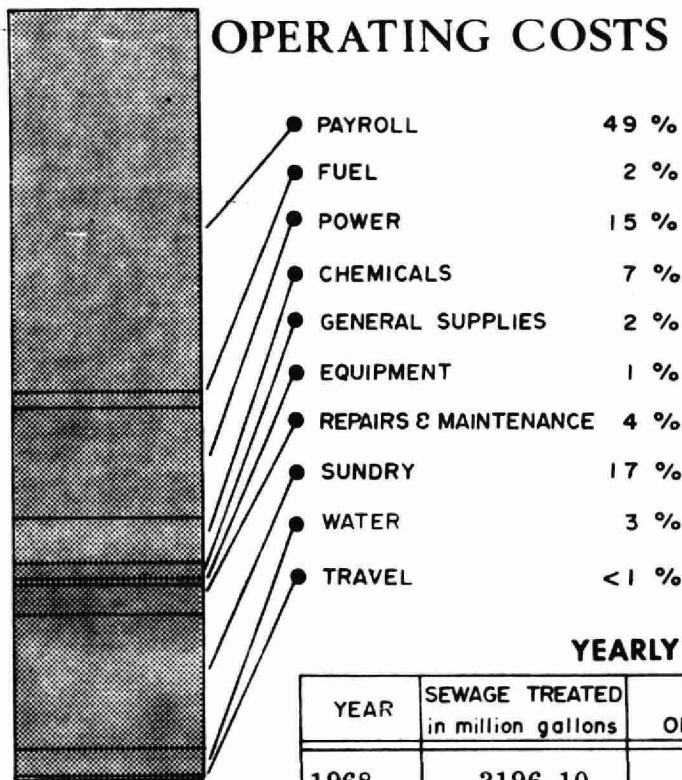
Balance @ January 1, 1972	\$ 179, 263. 72
Deposited by Municipality	13, 314. 93
Interest Earned	<u>11, 787. 10</u>
	\$ 204, 365. 75
Less Expenditures	<u>5, 111. 45</u>
Balance @ December 31, 1972	\$ <u>199, 254. 30</u>

PROJECT COSTS

2-0210-66 NET CAPITAL COST	\$102,395.13
DEDUCT - Portion financed by CMHC (Final)	(69,707.07)
MUNICIPAL ADVANCES	<u>(29,000.00)</u>
Long Term Debt to MOE	\$ <u>3,688.06</u>
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1972	\$ <u>420.82</u>
Net Operating	\$ -
Debt Retirement	107.00
Reserve	1,167.87
Interest Charged	<u>272.49</u>
TOTAL	\$ <u>1,547.36</u>

RESERVE ACCOUNT

Balance @ January 1, 1972	\$ 3,645.13
Deposited by Municipality	1,167.87
Interest Earned	<u>263.55</u>
	\$ 5,076.55
Less Expenditures	<u>-</u>
Balance @ December 31, 1972	\$ <u>5,076.55</u>



1972 COSTS

TOTAL ANNUAL COST

NET OPERATING	69 %
DEBT RETIREMENT	4 %
RESERVE	5 %
INTEREST	22 %

YEARLY OPERATING COSTS

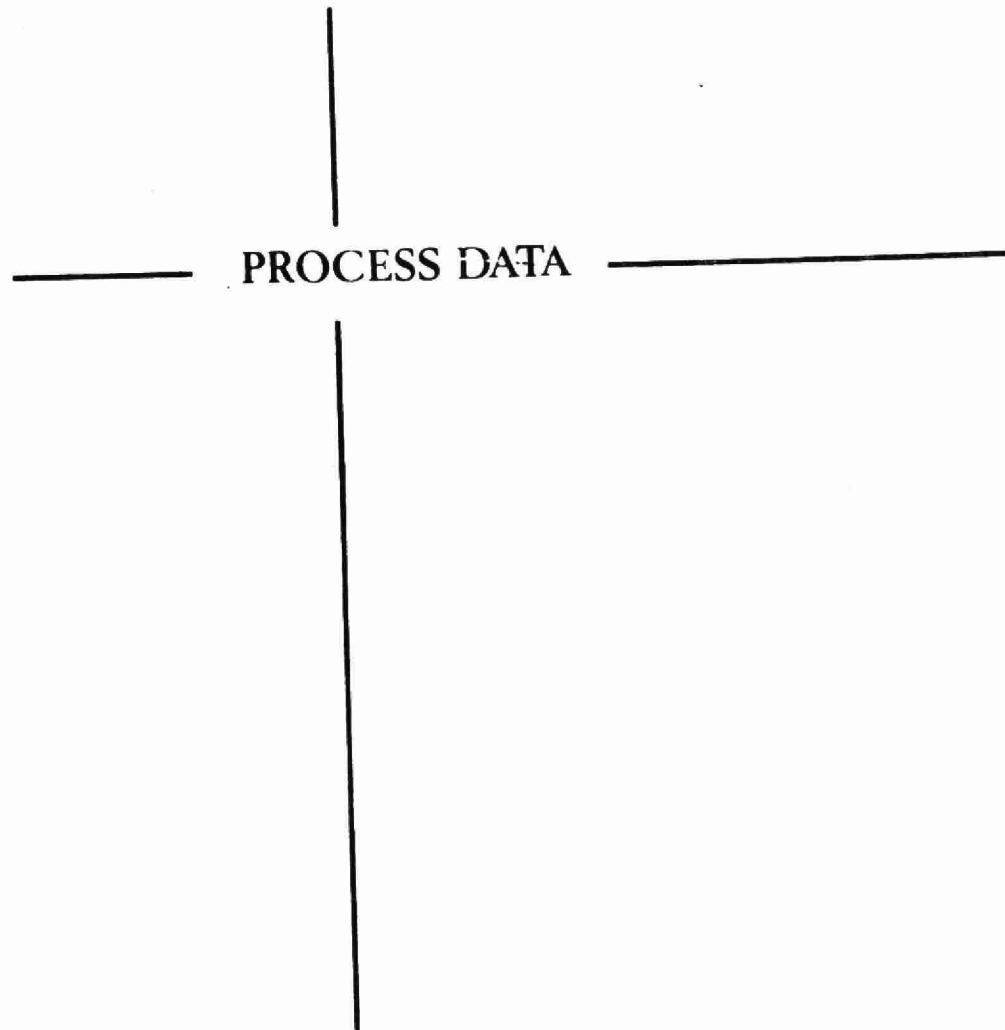
YEAR	SEWAGE TREATED in million gallons	TOTAL OPERATING COSTS	TREATMENT COSTS	
			\$ per million gal	¢ per lb BOD
1968	3196.10	136,641.46	42.75	14 cents
1969	3162.70	146,194.04	46.22	11 cents
1970	3107.00	162,677.59	52.30	17 cents
1971	3423.6	169,746.74	49.60	16 cents
1972	3748.	189,642.74	51.00	14 cents

MONTHLY OPERATING COSTS

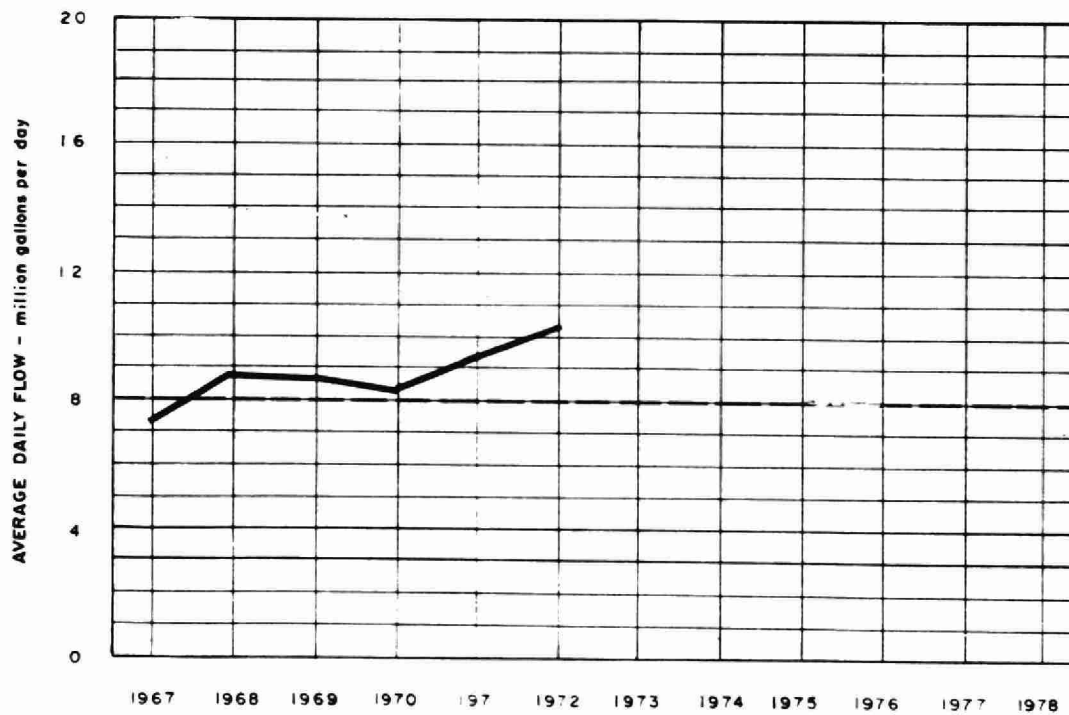
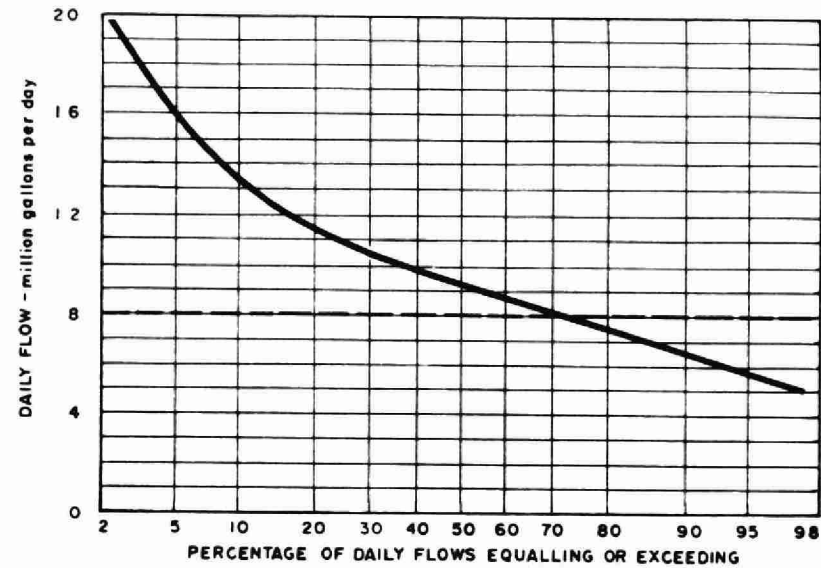
MONTH	TOTAL EXPENDITURE	REGULAR PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICALS	GENERAL SUPPLIES	EQUIPMENT	REPAIRS and MAINTENANCE	SUNDRY*	WATER	TRAVEL
JAN	11508.30	5623.07		288.24	4034.38				19.53	1462.90	80.18	
FEB	11149.33	7342.32		212.84	847.67		146.55		648.90	1546.85	404.20	
MAR	16759.08	6364.33		506.40	3238.44	4275.00	241.73		189.27	1445.69	471.66	26.56
APR	12367.50	7795.62		158.02	887.77	635.67	290.52		408.53	1610.77	580.60	
MAY	14252.61	7308.24		387.34	4335.22		326.46		204.19	1130.22	387.04	173.90
JUNE	14650.02	10657.25			914.01		178.39	28.52	918.38	1512.73	440.74	
JULY	6756.86	190.19		255.37	1498.69	2052.00	208.19	18.64	43.59	1924.13	566.06	
AUG	10842.33	6986.20		36.08	2465.78		200.48		451.92	106.76	574.79	20.32
SEPT	13435.03	7432.90	305.51	200.94	1884.96		140.35			2812.33	635.00	23.04
OCT	16381.26	7842.24	22.15		2000.16		242.66	124.95	4079.98	1418.94	650.18	
NOV	24230.40	385.43			5039.37	2878.40	34.16	-67.85	33.70	15180.30	611.19	
DEC	37310.02	25937.96	241.18	998.62	998.46	4107.60	1541.27	558.01	456.16	1599.71	623.98	247.07
TOTAL	189642.74	93865.75	568.84	3043.85	28144.91	13948.67	3550.76	797.97	7454.15	31751.33	6025.62	490.89

Brackets indicate credit.

* Sundry includes sludge haulage costs of \$16,077.25



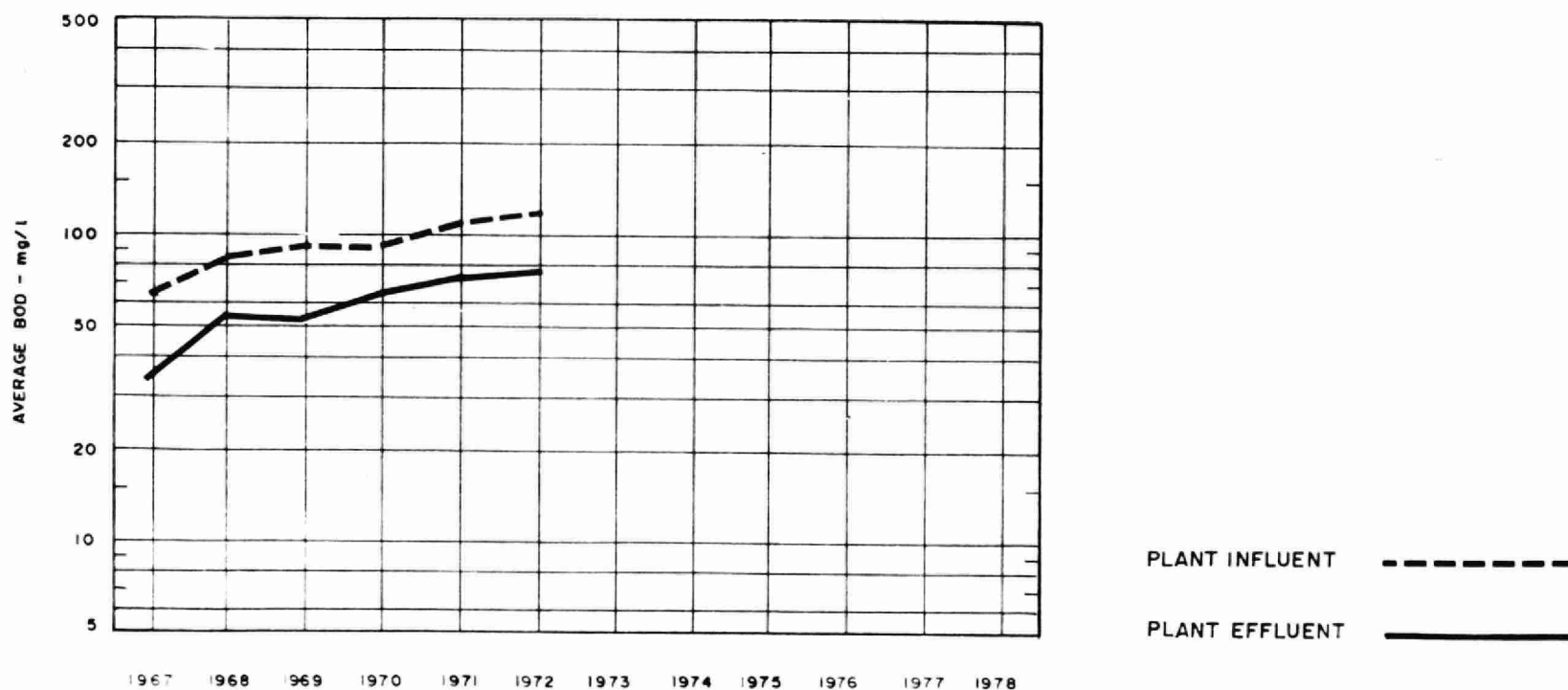
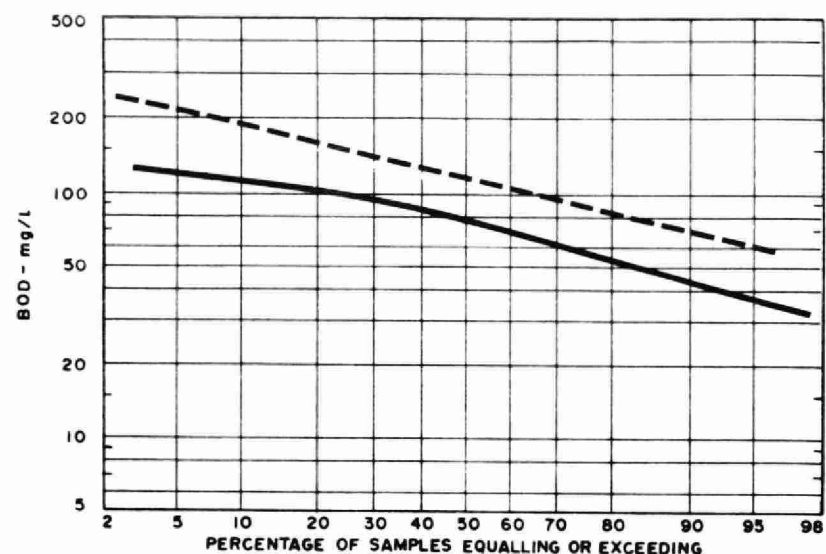
FLOWS



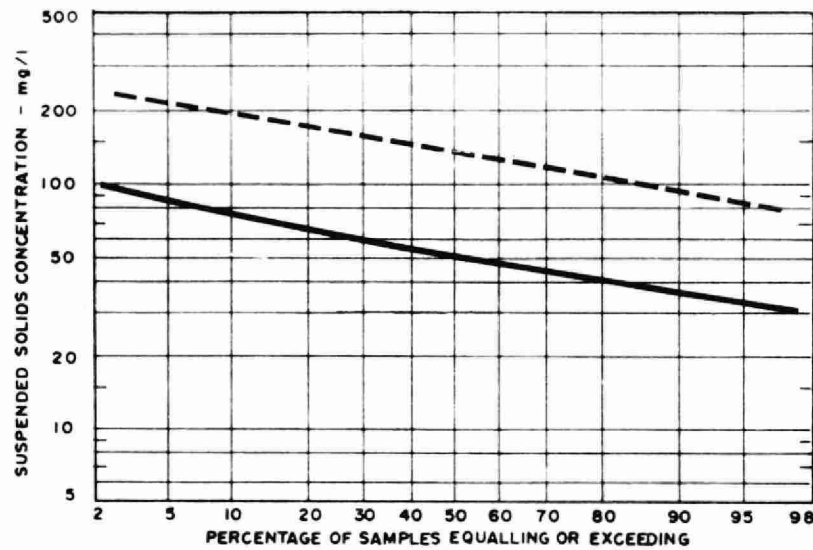
PLANT PERFORMANCE

MONTH	FLOWS			BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				PHOSPHORUS	
	TOTAL FLOW million gallons	AVERAGE DAY mil. gal	MAXIMUM DAY mgd	INFLUENT mg/l	EFFLUENT mg/l	REDUCTION		INFLUENT mg/l	EFFLUENT mg/l	REDUCTION		INFLUENT mg/l P	EFFLUENT mg/l P
						%	10 ³ pounds			%	10 ³ pounds		
JAN	257.2	8.30	9.9	131	78	41	136	135	46	66	229	3.9	4.9
FEB	208.3	7.18	7.8	128	97	24	64	131	49	63	171	6.5	4.4
MAR	290.5	9.37	16.7	135	95	30	116	118	75	36	125	4.7	5.0
APR	522.9	17.40	24.6	55	41	25	73	106	50	53	292	5.2	3.6
MAY	303.0	9.80	15.0	108	80	26	85	121	47	61	224	7.1	5.8
JUNE	279.0	9.30	10.6	120	72	40	134	152	58	62	262	6.5	5.0
JULY	291.2	9.40	13.7	98	69	30	84	140	54	61	250	6.0	4.4
AUG	368.4	11.88	14.5	77	41	47	133	137	55	60	302	5.2	4.1
SEPT	366.0	11.80	17.0	95	82	14	48	123	52	58	260	6.5	5.0
OCT	327.8	10.57	15.1	119	79	34	131	124	48	61	249	6.5	5.0
NOV	312.1	10.40	16.1	125	74	41	159	141	57	60	262	7.5	5.4
DEC	221.3	7.13	7.1	176	111	37	144	158	50	68	239	9.8	7.0
TOTAL	3747.7	-	-	-	-	-	1307	-	-	-	2865	-	-
AVG.		10.2	MAXIMUM 24.6	115	77	33	109	138	54	61	239	6.3	5.0
No. of Samples	-	-	-	60	60	-	-	88	88	-	-	12	12

BIOCHEMICAL OXYGEN DEMAND

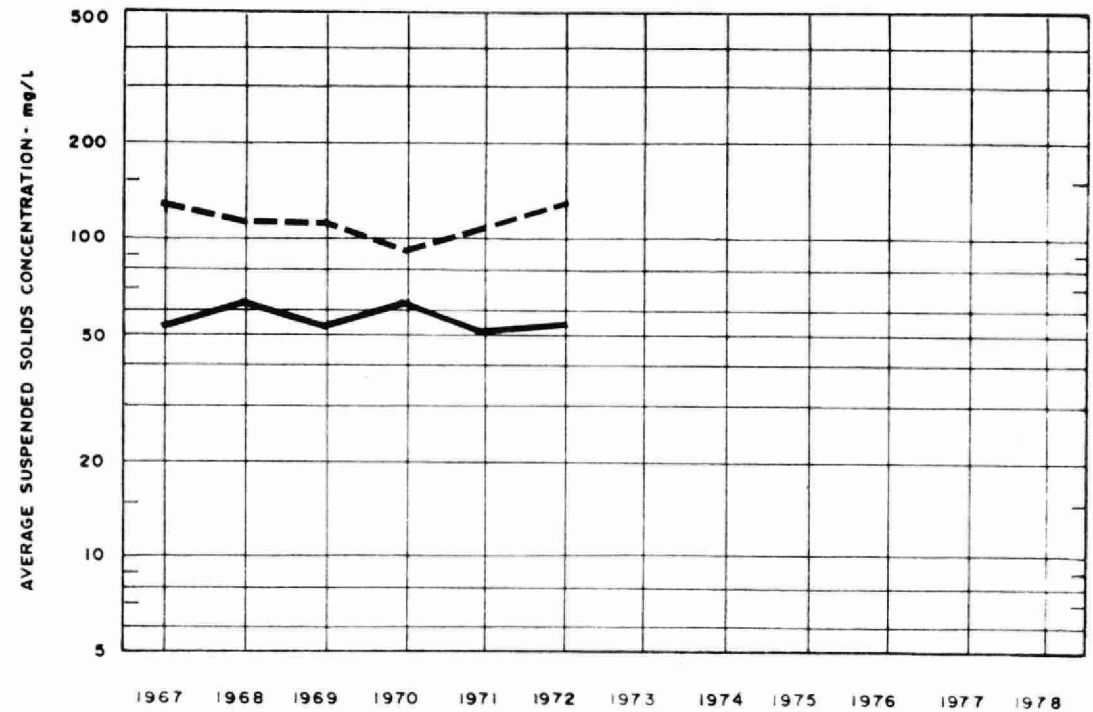


SUSPENDED SOLIDS

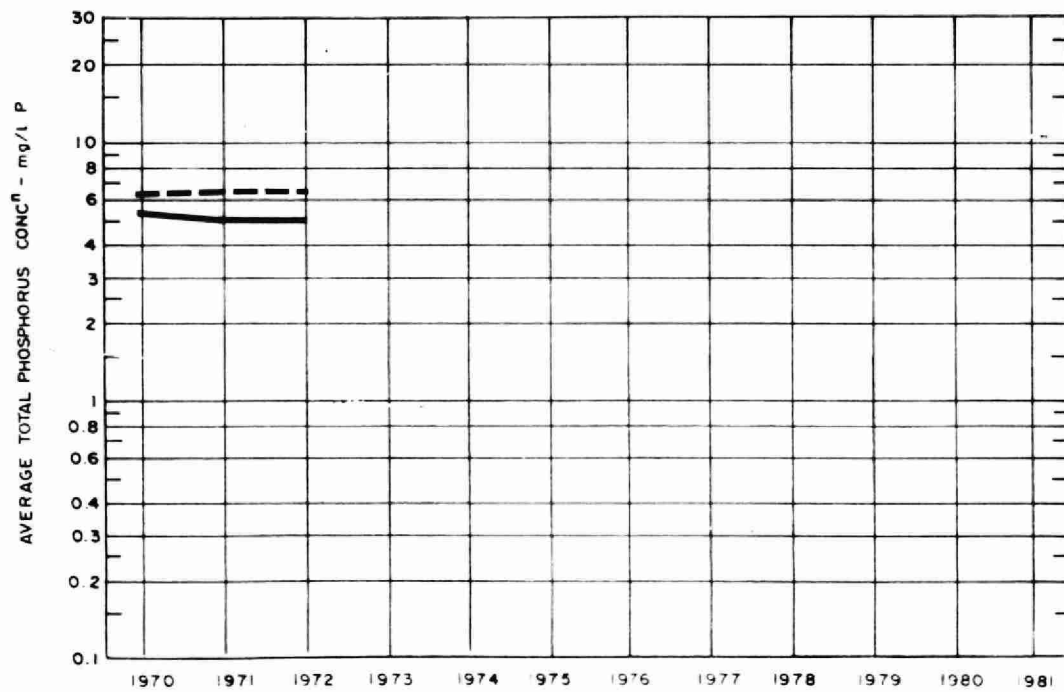
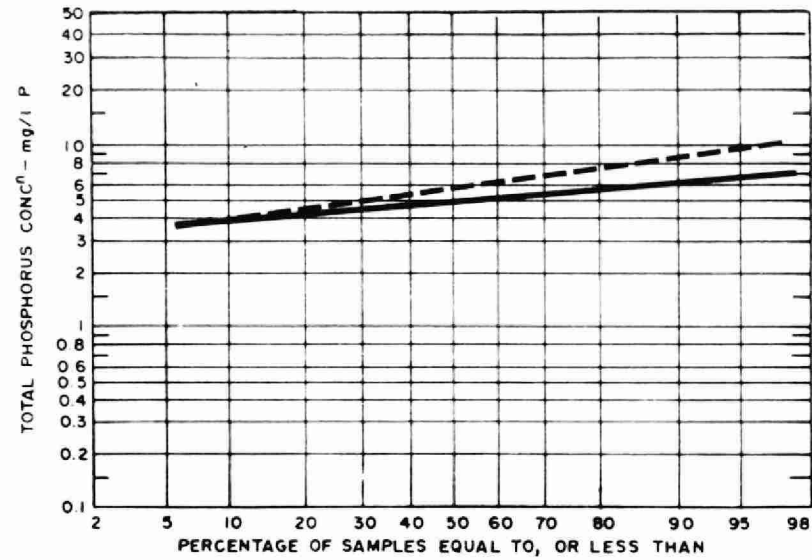


PLANT INFLUENT - - - - -

PLANT EFFLUENT —————



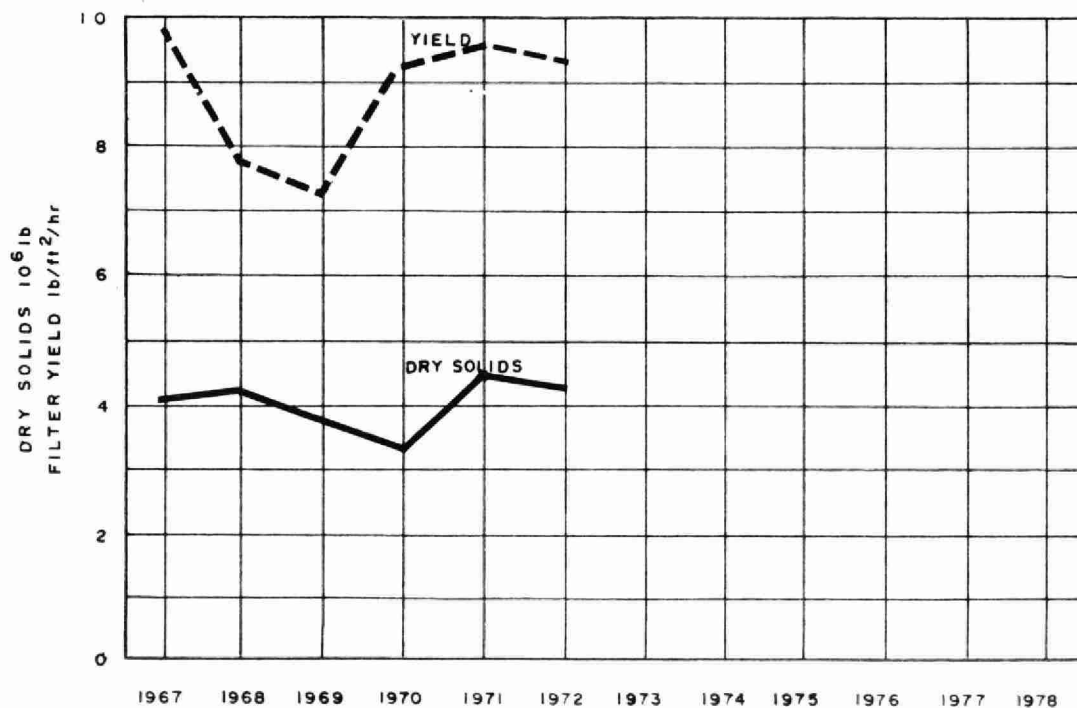
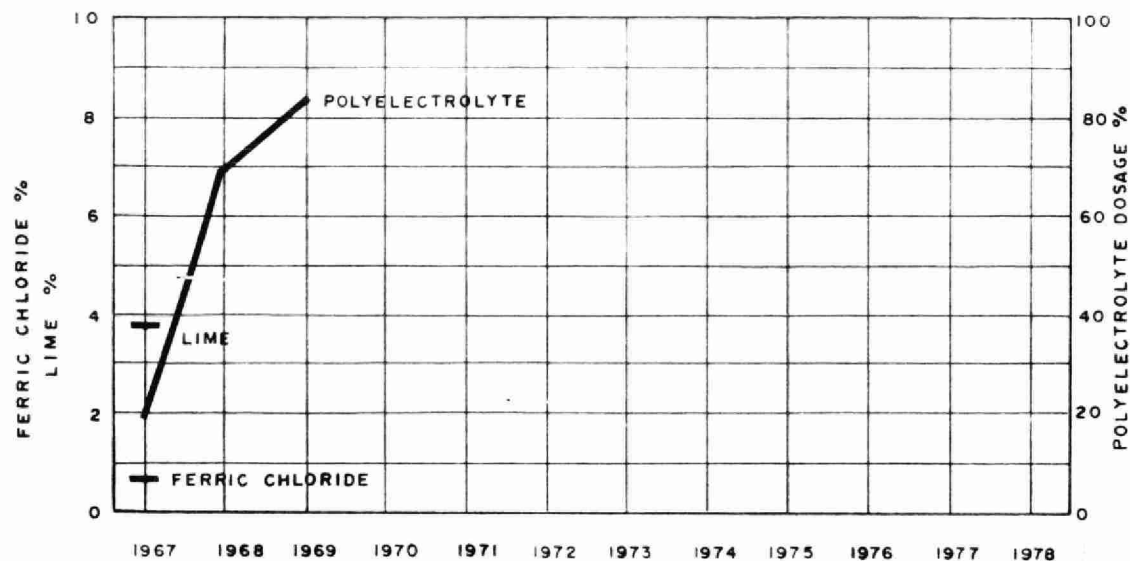
PHOSPHORUS



PLANT INFLUENT - - - - -

PLANT EFFLUENT —————

VACUUM FILTRATION



TREATMENT DATA

MONTH	GRIT	CHLORINATION		VACUUM FILTER OPERATION						
	QUANTITY REMOVED cubic feet	CL ₂ USED 10 ³ pounds	AVG. DOSE mg/l	TOTAL FILTER HOURS	SLUDGE TO FILTERS			YIELD (AVG) lb/ft ² /hr.	FILTER CAKE T-S percent	SLUDGE HAULED cubic yards
					QUANTITY 10 ⁵ gallons	TOTAL SOLIDS percent	DRY SOLIDS 10 ⁵ pounds			
JAN	130	14.0	5.5	210	7.5	5.1	3.9	9.1	26.6	825
FEB	90	13.2	6.3	161	5.5	5.2	2.9	8.8	22.0	685
MAR	150	12.4	4.3	222	7.8	5.3	4.1	9.3	22.0	810
APR	388	17.5	3.4	154	6.9	5.3	2.7	8.3	23.6	600
MAY	310	17.7	5.8	199	6.8	5.1	3.5	8.7	24.8	780
JUNE	170	19.4	7.0	212	7.6	5.1	4.1	9.6	23.6	825
JULY	180	18.9	6.5	176	6.2	5.0	3.5	10.0	24.0	705
AUG	210	15.2	4.1	196	6.6	5.4	3.7	9.3	25.1	795
SEPT	90	16.1	4.3	192	6.4	5.6	3.7	9.4	26.1	732
OCT	198	17.0	5.2	214	7.1	5.5	4.0	9.2	23.7	795
NOV	140	14.9	4.7	206	6.3	6.1	3.5	9.1	24.1	790
DEC	110	14.1	6.4	182	6.1	5.4	3.3	9.5	22.8	720
TOTAL	2167	190.4	-	2324	80.8		42.9			9062
AVG.	0.6 cu. ft/mil gal	15.8	5.1	194	6.7	5.3	3.6	9.3	24.0	755

Note: No conditioning chemicals were used in vacuum filtration

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